

REMARKS

Favorable reconsideration is respectfully requested in light of the following remarks.

Currently, claims 1-6 and 11-22 are pending in the present application. Claims 3-6 and 11-22 are withdrawn.

Claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,235,147 to Lee et al. ("Lee"). Applicants respectfully traverse the rejection under 35 U.S.C. § 103(a).

Claim 1 recites a discharging method of solid matter for discharging solid matter stored in a container from said container that comprises "storing said solid matter in an intermediate section of said container; supplying a discharging liquid into a lower section of said container so as to generate a spiral flow of said liquid; providing said spiral flow of said liquid from said lower section to said intermediate section by increasing a liquid volume; gradually generating a spiral flow of said solid matter in said intermediate section by said spiral flow of said liquid; and discharging said liquid and most of said solid matter present in the form of said spiral flow from a discharge port formed in a bottom of said container such that said solid matter is discharged substantially completely from said container."

Applicants respectfully submit that Lee fails to disclose or render obvious, at least, the step of "storing said solid matter in an intermediate section of said container," as recited by claim 1. The Examiner contends on page 3 of the Office Action that semiconductors and their to-be-discharged contaminants shown in Fig. 10 of Lee read on "solid matter" and that the contended solid matter is positioned in an area between a horizontal conduit and a top of a liquid chemical level in a bath that is considered to read on "intermediate section." However, Fig. 10 of Lee

shows wafers 1 above and below the horizontal conduit or beyond the asserted intermediate section. Lee fails to disclose or render obvious that the semiconductors and their soon to-be-discharged contaminants may not be below the horizontal conduit or outside the contended intermediate section. Thus, Applicants respectfully submit that Lee fails to disclose or render obvious at least the step of “storing said solid matter in an intermediate section of said container,” as recited by claim 1, and therefore, a *prima facie* case of obviousness has not been made against claim 1.

Applicants respectfully submit that Lee fails to disclose or render obvious, at least, the step of “supplying a discharging liquid into a lower section of said container so as to generate a spiral flow of said liquid,” as recited by claim 1. The Examiner asserts on page 3 of the Office Action that Lee teaches supplying liquid chemical to nozzles 21 in Fig. 10 of Lee located in an area beneath the horizontal conduit that supplies liquid chemical to the spray line and that this area beneath the horizontal conduit is considered to read on the “lower section” of claim 1. The Examiner further contends on pages 3-4 of the Office Action that Lee teaches supplying liquid chemical to the nozzles located in the area beneath the horizontal conduit in order to contribute to making a vortex flow of liquid chemical within the treatment bath. However, Lee does not disclose or render obvious that the chemical is supplied only to the nozzles below the horizontal conduit. There does not appear to be any description in Lee that the nozzles 21 of Lee spray chemical 3 to a lower section of a container to generate a spiral flow. Thus, Lee fails to disclose or render obvious “supplying a discharging liquid into a lower section of said container...,” as recited by claim 1. Because Lee fails to disclose or render obvious another feature of claim 1, it

is respectfully submitted that a *prima facie* case of obviousness has not been made against claim 1.

Also, col. 5, lines 32-37, of Lee states that “the chemical 3 sprayed from the nozzle 21 flows obliquely along the surface of the wafer 1 centering the center of the wafer 1, and away from its center” and that the “flow of the chemical 3 causes the vortex of the chemical inside the bath 10 to further activate the etching process of the chemical 3.” Thus, Lee states that the chemical 3 sprayed from the nozzle 21 causes a vortex of the chemical already in the bath 10. Therefore, the chemical sprayed from the nozzle is not supplied so as to generate a spiral flow of the chemical from the nozzles, as required by claim 1. Accordingly, Lee does not disclose or render obvious the step of “supplying a discharging liquid into a lower section of said container so as to generate a spiral flow of said liquid,” as recited by claim 1. Because Lee fails to disclose or render obvious another feature of claim 1, Applicants respectfully submits that a *prima facie* case of obviousness has not been made against claim 1.

Applicants respectfully submit that Lee fails to disclose or render obvious, at least, the step of “providing said spiral flow of said liquid from said lower section to said intermediate section by increasing a liquid volume,” as recited by claim 1. On page 4 of the Office Action, the Examiner contends that Lee teaches supplying a liquid chemical in order to contribute to making a vortex flow and that the flow is considered to be provided “from said lower section to said intermediate section” and to increase the volume of liquid. However, the Examiner correctly finds that Lee does not explicitly teach that the vortex flow causes a vortex flow of removed semiconductor contaminants and does not explicitly teach that most of the solid contaminants are discharged from the bath. Thus, the Examiner cites col. 5, lines 14-37, and col.

9, lines 39-45, as teaching the generating of a vortex flow of the liquid chemical during the processing of the wafers. Col. 5, lines 14-20, state that a chemical spray part 21 “comprises a nozzle 21” and that the “nozzle 21 is constructed with a plurality of nozzles between the plurality of the wafers 1 to spray the chemical 3 to the plurality of wafers 1 so that the chemical 3 flows along the surface of the wafers 1.” However, the cited portions of Lee do not disclose or render obvious that the nozzles provide a spiral flow of chemical from a lower section to an intermediate section by increasing a liquid volume, as required by claim 1. Thus, because the cited portions of Lee fail to disclose or render obvious that a vortex flow is provided from a lower section to an intermediate section, as recited by claim 1, Applicants respectfully submits that a *prima facie* case of obviousness has not been made against claim 1.

Also, the Examiner contends that a vortex flow is considered to be provided from a lower section to an intermediate section because the nozzles are arranged from below a horizontal conduit to above the horizontal conduit, as shown in Fig. 10 of Lee. However, no portion of Lee discloses or renders obvious that the nozzles produce a vortex flow that is provided from a lower section to an intermediate section, and the Examiner does not cite any portion of Lee that supports his contention. In contrast, col. 5, lines 32-37, of Lee states that “the chemical 3 sprayed from the nozzle 21 flows obliquely along the surface of the wafer 1 centering the center of the wafer 1, and away from its center,” and col. 5, lines 38-42, of Lee explains that “[i]n addition, by rotating the wafer guide 30 to the opposite direction of the vortex flow of the chemical by the motor 35 of the wafer guide rotation apparatus, the etching process can be further activated.” Applicants respectfully submit that the rotation of the wafer guide opposite to the vortex flow of Lee prevents the vortex flow from being provided from a lower section to an

intermediate section, as contended by the Examiner. Thus, because no portion of Lee discloses or renders obvious that a vortex flow is provided from a lower section to an intermediate section and because no portion of Lee has been cited by the Examiner as disclosing that a vortex flow is provided from a lower section to an intermediate section, Applicants respectfully submits that a *prima facie* case of obviousness has not been made against claim 1.

Furthermore, col. 4, lines 6-9, of Lee explicitly states that “a wet-etching facility for manufacturing semiconductor devices according to the present invention comprises a bath 10 containing a certain amount of chemical 3,...” Thus, Lee discloses that the bath 10 contains a certain amount of chemical 3. Col. 4, lines 6-15, of Lee explicitly states that “a wet-etching facility for manufacturing semiconductor devices according to the present invention comprises...a wafer guide 30 having a plurality of wafers 1 horizontally held facing downward, and immersing the plurality of wafers 1 into the chemical 3,...” Thus, Lee describes that the wafers 1 are immersed in the chemical 3. Because Lee describes that the wafers 1 are immersed in the chemical 3, Lee cannot disclose or render obvious the step of providing a liquid from a lower section to an intermediate section by increasing a liquid volume, as required by claim 1. Therefore, because Lee fails to disclose or render obvious at least one feature of claim 1, Applicants respectfully submits that a *prima facie* case of obviousness has not been made against claim 1.

The Examiner further contends that, when the nozzles begin to inject liquid chemical into the treatment bath in order to generate the vortex flow, the volume of liquid injected into the treatment bath increases. However, the Examiner does not cite any portion of Lee as teaching this feature. Also, claim 1 recites “providing said spiral flow of said liquid from said lower

section to said intermediate section by increasing a liquid volume.” Col. 6, lines 51-58, of Lee states that “as shown in FIG. 10, according to further embodiment of the present invention, the wet-etching facility for manufacturing semiconductor devices is constructed in a manner that some of the chemical 3 discharged from the chemical discharge part is filtering-treated, and the chemical 3 is collected to the chemical spray part 20 by the open/close operation of a valve 72 to be recirculated to the chemical spray part 20.” Lee does not describe that the collection and recirculation of some of the chemical 3 results in providing the vortex flow of the chemical 3 from a lower section to an intermediate section by increasing a volume of the chemical. Thus, because no portion of Lee discloses or renders obvious that a vortex flow is provided from a lower section to an intermediate section by increasing a liquid volume and because no portion of Lee has been cited by the Examiner as disclosing that a vortex flow is provided from a lower section to an intermediate section by increasing a liquid volume, Applicants respectfully submit that a *prima facie* case of obviousness has not been made against claim 1.

As for the rejection under 35 U.S.C. § 103(a), of claim 2, Applicants note that this claim depends from claim 1 and recites the same combination of allowable features recited in claim 1 as well as additional features that define over the applied art. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a), of claims 1 and 2, be withdrawn, and the claims allowed.

Furthermore, Applicants respectfully submit that, in the method of claim 1, the discharging liquid is supplied from a lower section of a container in order to create an upwardly directed spiral flow. On the contrary, in the invention of Lee, the plurality of nozzles 21 are

arranged from lower section to upper section inside the bath 10. These structural differences occur due to the following differences in the purposes of each invention.

Specifically, the method of claim 1 is a discharging method of solid matter used for extracting, for example, coffee or tea, etc. Therefore, much solid matter, such as, grinded coffee, tea leaf, or the like, is mixed into the liquid in the container. Thus, much solid matter may not be completely discharged by the mere spiral flow since the solid matter may adhere on a bottom surface of the container. In order to overcome such a disadvantage, in the method of claim 1, the discharging liquid is supplied from the lower section of the container and the upwardly directed spiral flow is generated thereby the solid matter is suspended upwardly. Therefore, almost all the solid matter can be discharged together with the discharging liquid.

In contrast, the invention of Lee is an etching facility for semiconductor devices. In the etching facility, a quantity of the solid matter contained in the chemical is relatively small compared to the method of claim 1. Therefore, the invention of Lee does not assume that any solid matter remains on a bottom surface of the bath 10. Thus, it is not required to supply the discharging liquid into the lower section in order to generate the upwardly directed spiral flow. Due to these technical backgrounds and differences, the invention of Lee provides the plurality of nozzles 21 from lower section to upper section. In the arrangement of nozzles 21 in Lee, upwardly directed spiral flow cannot be generated.

As explained above, the purpose and configuration of the method of claim 1 are significantly different from that of Lee. Therefore, the method of claim 1 is not obvious in view of Lee. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a), of claim 1 and claim 2 which depends from claim 1, be withdrawn.

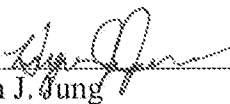
Should any questions arise in connection with this application, or should the Examiner believe a telephone conference would be helpful in resolving any remaining issues pertaining to this application, it is respectfully requested that the undersigned be contacted at the number indicated below.

EXCEPT for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account 50-0573. This paragraph is intended to be a CONSTRUCTIVE PETITION FOR EXTENSION OF TIME in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully Submitted,

Date: September 14, 2011
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